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CASE 17

REMARKS ON THE IMPORTANCE OF  
ANÆSTHESIA FROM CHLOROFORM.  
IN SURGICAL OPERATIONS.

ILLUSTRATED BY TWO CASES.

BY VALENTINE MOTT.

READ OCTOBER 4, 1848.

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No event has occurred in the whole range of the History of Surgery, since the discovery of the ligature by Ambrose Paré, at all comparable to the anæsthetic influence of the æthers in surgical operations. It not only robs surgery of its greatest terrors, by suspending sensibility and all consciousness of pain during the performance of operations; but it enables us to operate without the dread of any shock to the nervous system.

We are abundantly satisfied that now severe and formidable operations may be performed under the influence of those agents, which the most bold and adventurous surgeon would not have had the temerity to touch.

It is not my intention to examine into the history of the discovery of these remarkable agents, or the question of their manner of acting on the human body. For the present, we have had, perhaps, enough on these points, at least until a more extended series of results shall be recorded, to enable a purely legitimate deduction to be made.

We view the discovery of the peculiar influence of these substances upon the brain and nervous systems of human beings, and the application of them to operative surgery, as the greatest present from chemistry to surgery that ever was made, and a boon to suffering humanity of the most inappre-

ciable value. No imagination can conceive, and no tongue can tell, the accumulated woes it is destined to soothe and assuage. It far outstrips in its surgical value to the human race, any discovery of which the present century can boast.

Pain reduces all ranks to a level—it makes all men cowards. Some constitutionally and physically suffer very little from surgical operations; while others, from moral courage or religious culture, are enabled to endure great bodily torture. These, however, form but a very small item in the great mass of the family of mankind, and therefore deserve to be named only as exceptions to the great and general rule.

The dread of suffering has prevented thousands of human beings from submitting to necessary operations, and their lives have been the forfeit. Away with the stupid fanaticism that would inculcate the patient endurance of suffering, when it can be relieved. It is a Divine admonition to soothe the sorrows, and to mitigate the pains of poor human nature. And can any rational and intelligent being for a moment entertain a doubt as to the propriety of using a safe and certain agent, to abolish for a time all consciousness of pain under surgical operations?

The object of the writer is only to extol the benefit of chloroform, in cases in which the shock of the operation would in all probability be fatal without its influence. In the cases which follow, I am free to say, that I would not have ventured to perform either of them, but for the influence of this delightful agent.

From some experience in operations, I am very certain that they would both have perished long before the completion of the tedious and difficult dissection which was involved in each of them. Greater care is necessary to guard against hæmorrhage after operations performed under anæsthetic influence, from the collapse that attends the full effect of it. More time therefore has to be given, before the wound is dressed, in order that the action of the heart and arteries may be fairly restored.

*Case I.* A. B., a little girl from Connecticut, aged between nine and ten years, of an excellent constitution and good

health, was brought to me in May, 1848, with a cluster of large tumors in the neck, of different sizes, from a man's fist to that of a hen's egg, and even a black walnut, evidently making a most extensive mass of *lymphatic glandular tumors*. The whole was not much less in size than her head—reaching from behind her ear to below the clavicle and under it—extending up to the larynx and trachea, crowding them to the opposite side, and producing considerable difficulty of breathing. It had no feel of fluctuation at any part, but was elastic and without pain when handled. It had been growing for nearly five years, and commenced in one small tumor, below and about the posterior angle of the lower jaw. From this arose others, until the enormous enlargement took place, as may be seen in the drawing which accompanies this, and the morbid specimen in bottle No. 1, which is carefully preserved.

Various modes of treatment had been from time to time adopted, both local and general, popular and professional, without at any time producing the least benefit. The last that was tried were the different preparations of Iodine, locally and generally. For nearly two years she used the hydriodate of potassa as an internal medicine, and ointment of the same was rubbed upon the tumors, alternated with the tincture, without the least benefit to the enlargement; on the contrary, the size continued to augment gradually.

In a state of despair, the distressed parents brought her to me, to know if any other treatment could be recommended, or if it was possible to remove the whole by an operation with the least prospect of a favorable result.

I informed them that an operation would be difficult and dangerous, both from the unavoidable loss of blood, as well as the shock upon the nervous system. That I would not be willing to attempt it without she was put under the influence of chloroform. This I informed them was the only thing that would justify an attempt to remove the whole mass, as the shock upon the nervous system would thereby be completely prevented. That with this anæsthetic agent I felt myself warranted in performing the operation.

Inhaling the chloroform from a handkerchief, she was in a

few minutes put under the full influence of this valuable agent.

An incision was now made in the longest direction of the tumor, beginning from above and behind the ear, and carried obliquely downward and forward over the clavicle, near to the origin of the sterno-cleido mastoid muscle.

As the external jugular vein took its usual course over the tumor, I directed an assistant to compress it below the line of the incision to prevent the ingress of air, and another to seize with the forceps the upper extremity and place a ligature upon it. This was expeditiously done, the vein being considerably enlarged.

The first incision only went through the skin and platysma myoides, so as to divide the superficial jugular. The next cut the under layer of the superficial cervical fascia. It was now found that the sterno-mastoid was spread out very thin to some extent upon its outer margin over the tumor. This expanded state of the muscle might have led to the misapprehension that the mastoid was not over it. The integuments and muscle were now dissected off from the lower edges of the incision, with a view to get under it from below and on the inner sides. As soon as I found the mastoid was passing over the tumor, I at once anticipated a difficulty in its removal.

This was fully realized in the subsequent steps of the operation. The thin expanded muscle was now carefully detached from the tumor, after which the separation of it from all the adjacent parts in front and below took place. It was connected with the larynx and trachea in front, inferiorly to the inner surface of the clavicle—posteriorly to the whole extent of the carotid sheath, and behind it passed under the trapezius muscle.

An isolated tumor the size of a pigeon's egg was discovered below the level of the clavicle, with apparently the deep cervical fascia over it. On passing a double hook into it and raising it, such was its depth and attachment to the subclavian vein, that I did not think it prudent to remove it.

Although I was careful to cut through all the superimposed tissues, so as perfectly to denude the tumor before attempting





its separation, I do not think I ever met with such firm adhesions to the surrounding parts, except in malignant forms of disease. Here and there only could the handle of the scalpel or fingers accomplish any separation. At every step it seemed as if condensed and duplicated cellular membrane with arteries were entering into every interstice and irregularity of the tumor, to add to the difficulty of its removal, and to prolong the operation.

By patience and care, however, and the influence of the chloroform, a most invaluable auxiliary in difficult operations, particularly upon children, I finally succeeded in removing the enormous mass from all the contiguous and important parts, with perfect satisfaction to myself and safety to the patient.

Many large arteries and veins were tied during the operation, but the loss of blood was less than might have been expected, from the promptness and readiness with which we secured every bleeding vessel. To prevent secondary hæmorrhage, we allowed the anæsthetic influences to pass off before dressing the wound. As far as my observation has gone, I would suggest this as a proper point of practice.

When the free action of the heart and arteries had been restored for some ten or fifteen minutes, and no further hæmorrhage occurring, the wound was dressed with several stitches and adhesive straps, lint, compress, and a moderately tight bandage around the neck.

Most of the pain she complained of was a little smarting, which probably arose from the stitches being introduced after the insensibility of the chloroform had passed off. In the course of half an hour after the wound was dressed, four drops of Majendie's solution of morphine were administered, and in the evening, being restless, two more were given.

No untoward circumstance occurred after the operation, everything went on favorably, and the wound mostly healed by the first intention. After three weeks from the operation, she left for the country.

*Case II.* was a beautiful little boy, not quite five years old, who about a year since was observed by his mother to have a small tumor or enlarged gland on the side of the neck, below

the posterior angle of the lower jaw. It continued to enlarge gradually, unaccompanied with pain, until it attained the monstrous size delineated in the accompanying drawing, and contained in the jar before us.

At its commencement, means were taken by internal medicine and local applications to remove it. They were faithfully persevered in for months, without the least benefit; indeed the tumor continued gradually to increase in size.

It occupied the entire side of the neck, reaching from above and behind the ear, to below the clavicle. It went underneath, as well as lapped over the bone. In front it passed beyond the centre line of the larynx and trachea, crowding these parts to the opposite side—and behind it passed under the trapezius muscle. The head was considerably turned, from its immense size, to the opposite side. The appearance of it externally was irregular and lobulated. To the feel it was firm, and without the least fluctuation at any point.

The sterno-mastoid muscle could be more distinctly discovered traversing the tumor than in the former case. A number of veins were also taking the course of the external jugular, instead of one distinct trunk.

The operation was performed at one o'clock on the 26th of May, 1848. He was previously put under the influence of chloroform.

To command the whole tumor a crucial incision was made; the first extended from behind the ear to the clavicle—the second a little obliquely from the anterior to the posterior edges, so as to traverse the longest axis of the whole mass. The incisions were carefully carried through the integuments, platysma myoides, and under layer of the superficial fascia, so as fairly to denude the tumor. The dissection of the lower flaps was now commenced, tying veins and arteries as they were divided. At times it seemed for a short distance as if the separation would readily take place; but it was soon interrupted by firm duplications of cellular membrane, and vessels passing into the irregularities, which constantly embarrassed and prolonged the operation. In dissecting off the lower and anterior flap, the mastoid muscle was found to

be so incorporated with the tumor, as to make it necessary to divide it about two inches from the sternum and clavicle.

This step enabled me to get at the lower part just above the clavicle, but what next appeared was truly embarrassing, it was the deep jugular vein running through the tumor. On the inner part the common carotid was dissected perfectly bare for several inches from the tumor, but the vein was so imbedded in the mass that it was totally impracticable to save it.

For a time I left this part of the dissection, and turned my attention to the separation of other parts, hoping that I might be saved, perhaps, the division of it, but there was no alternative left. I therefore seized it with the dissecting forceps, divided it, and a ligature was instantly placed below the forceps. The upper end was readily compressed by the finger of an assistant while the dissection was continued.

This being done, I separated the lower portion of the tumor from the remaining part of the deep jugular, the tumor here having destroyed by pressure the sterno-hyoid and sterno-thyroid muscles. It was then detached from the upper and inner edge of the clavicle, to the anterior margin of the trapezius muscle. Getting under it in this way, it was more readily and safely detached from the parts below. On dissecting it from over the scalenus anticus muscle, I carefully protected the phrenic nerve. The posterior and upper part was now dissected from over the mastoid process, and turned down. A portion of the tumor was now seen to pass under the mastoid muscle, and to become so completely incorporated with it, as to make it proper here also to divide the muscle again, in order to proceed with the entire removal of the whole mass. This was done, leaving the middle third of the muscle connected with the tumor.

The anterior and upper part was now separated from the side of the pharynx and larynx, but it was found after dissecting it from the common carotid opposite the thyroid and cricoid cartilages, that the deep jugular could not be safely detached; we therefore applied a second ligature to it about an inch below the angle of the lower jaw, and divided below it, leaving several inches of the vein in the tumor, as may be

seen in the preparation. After this the whole mass readily came away.

In the course of this dissection, tedious and difficult, more than twenty ligatures were applied to arteries and veins. The quantity of blood lost during the whole operation did not exceed six ounces, several thought four or five.

After removing several small tumors from along under the trapezius, he was allowed to come from under the influence of the chloroform, before the wound was dressed, in order to favor the bleeding from any arteries that might remain untied. When all seemed safe, the wound was closed with several stitches and adhesive straps; lint compress and roller moderately tight completed the dressing.

As soon as the anæsthetic effect of the chloroform passed off, he complained of a little smarting, but did not make any particular moan until the stitches were introduced. In the course of the first hour after the wound was dressed, he took three drops of morphine to allay the smarting—and in the course of the night two more. No shock nor collapse attended the going off of the chloroform, either immediately or remotely. It was surprising and gratifying to witness this wonderful fact, and particularly to some of us accustomed to perform operations upon children and infants. In both these cases the influence of the chloroform was kept up for about an hour and a half.

To be able to put the brain and nervous system in such a state of insensibility and quiescence, as to be totally unconscious, and then lastly, after the loss of blood, and the completion of the operation, that there shall not be any collapse seen or felt by the patients, are among the wonderful facts of the present age.

He passed the night following the operation very comfortably, having a full amount of sleep. On the second day he took some aperients, and every care was now given to prevent an undue degree of inflammation. No fever occurred to require any other treatment. On the sixth day from the operation, the wound was dressed, and suppuration being established about the stitches, they were taken away. Most of the wound was united by the adhesive process; the ligatures

came away in due time, and the wound regularly and kindly healed. When it had sufficiently healed, care was taken by a bandage and position in bed, to prevent the head from becoming awry. Not only was the distortion produced by the pressure of the tumor before its removal remedied, but any further inconvenience from the loss of the middle third of the mastoid muscle.

Thus have terminated two important surgical cases. To me the result has been peculiarly gratifying. In some respects they presented peculiarities that must interest every surgeon. One is, that they could not have been borne without the anæsthetic influence of the chloroform. The shock to the nervous system in my opinion would have been fatal to both. The unavoidable duration of the operation, together with the loss of blood, would have deterred every prudent surgeon from attempting the removal of these enormous masses, without the influence of this invaluable agent.

*New York, June 5th, 1848.*

Since the preceding cases were drawn up for the Academy, it has been my melancholy misfortune to have encountered a fatal one from the unavoidable loss of blood attending the operation. The tumor was identical in character with the preceding, and similarly situated. The removal of the mass, which was considerably smaller than either of the two before described, was difficult and tedious, as the description which follows will clearly point out. Most of the blood lost was from veins, all of which were enormously enlarged. Several were tied previously to being divided, but what blood was lost, prevented any reaction following the operation. I do not believe he lost one tablespoonful of arterial blood.

I am delighted to be able to state, that he recovered completely from the effect of the chloroform—that it acted as kindly and as favorably upon him as in any case in which I have used it, and that my confidence in it is not in the least changed.

*Case III.* I. M., a delicate boy, aged five years and six months, had a lobulated tumor upon the right side of the

neck, which had been growing for about one year before he came under my notice. It commenced a little below the ear, and slowly and regularly increased in size. It extended from above and behind the lobe of the ear to the clavicle and under it—backward beyond the edge of the trapezius, and in front over the larynx and trachea. It had a soft elastic feel, but did not fluctuate at any part. The external jugular was enlarged and running over the surface, as also a number of other superficial veins distended far beyond their natural size. Two large veins in front, opposite each side of the trachea, which I suppose to have been the superficial inferior thyroïdal, were nearly the size of my little finger.

He had a constant hacking cough, with considerable difficulty of breathing, which were steadily on the increase, so as greatly to annoy him during the day and disturb his sleep at night. He could only lie on the affected side. All his symptoms were gradually on the increase, as well as the tumor, which led the family to seek relief for the little sufferer. All internal means and external applications having been tried in vain, the attention of the parents and friends was directed to a surgical operation.

This they were informed could be done, but they were at the same time told that it would be attended with great danger to his life, indeed that he might die on the table; that my great fear was from the loss of blood, not the shock of the operation upon his nervous system.

I told them that I would not venture upon the operation without the influence of chloroform, and that by it all danger to the nervous system would be obviated, but that no skill could protect him from the loss of a certain amount of blood, and that the effect of the loss of this was my only fear. This we repeated to them over and over, and that with this fully understood, I was willing to perform the operation.

With all these things fully before them, they desired that the operation might be performed. It was accordingly done at 1 o'clock on the 22d of August.

He was readily brought under the influence of chloroform, but the anæsthesia was less profound than in the two former cases.

One incision was made behind, and a little above the lobe of the ear, and carried down to the clavicle in the direction of the outer edge of the sterno-mastoid muscle. It divided all the structures covering the tumor, including the mastoid muscle, which was expanded to more than double its width. Nearly one half the natural width of the muscle was left upon the outer side of the incision. At the instant of the first incision being made, a number of large veins were compressed and speedily tied. When the bleeding was fully commanded, another incision was made a little below the middle of the first, over the longest direction of the tumor, towards the top of the shoulder, which also freely divided all the superimposed structures.

On dissecting off the loose tissues, a large vein presented itself, not much less than the little finger, imbedded in the mass about two inches above the clavicle, and formed by an assemblage of smaller veins. A needle and double ligature was conveyed under it, before it was cut. The trunk below was carefully detached from the tumor, and turned with the flap over the clavicle. It continued distended with blood from the several branches which went into it.

The tumor being freed from its connexions at this point, my next object was to separate it from its attachments over the larynx and trachea. On raising the inner half of the mastoid muscle, about an inch from the line of the first incision through its middle, the deep jugular vein presented itself lying upon the tumor. This was cautiously separated, tying in the course of this dissection several small branches with two ligatures a short distance from the trunk. It was now drawn with the mastoid muscle towards the trachea, while the tumor was separated from the points underneath it. The deep jugular only was remaining over the tumor.

The mass being now dissected from over the larynx and trachea, a firm portion of it passed underneath the right side of the upper bone of the sternum and the sternal end of the clavicle. On raising the inner portion, the fingers could be insinuated partially beneath it, so that the innominata could plainly be felt. The other portion of it below the junction of the clavicle, and no small distance along this bone, seemed so

firmly attached to the subclavian vein, that I deemed it most prudent, after a careful inspection, not to attempt to remove it. It was therefore cut across at this point, leaving a small portion below the level of the sternum and clavicle. It was now seized with a double hook, raised up, and a strong double ligature passed around it, near the middle, and tied firmly. From rising and falling during respiration, I believe it was also attached to the pleura.

This done, the tumor was readily removed. Under the mastoid muscle, below and behind the ear, several smaller tumors were separated and taken away. Also from under the edge of the trapezius behind.

As soon as these were removed, he was permitted to be relieved from the anæsthesia of the chloroform. From the great care taken to secure every bleeding vessel during the whole course of the operation, not one continued to discharge blood. After waiting fifteen or twenty minutes the wound was closed with several stitches and adhesive straps, and a light dressing applied.

A small quantity of brandy and water was given him, but he refused to take much. He was now removed into bed, wrapped in blankets, and bottles of hot water placed near his back and feet. His skin was cool and moist—pulse very small and frequent. He did not vomit after the operation, though whilst it was being performed he had several turns of unloading his stomach. He had been permitted to eat, contrary to my wishes, a short time before the operation was performed.

In less than two hours from the operation his extremities became warm, with more action of the heart and arteries. This in a short time was followed by restlessness, for which five drops of morphine were administered. In a short time he fell into a quiet sleep, for two hours. A profuse sweat followed, and he gradually sank and expired in about seven hours from the operation. He retained the full possession of his mind until the last moment.

Long before chloroform was known, or used, we have met with cases in which death has followed operations, before

the wound was dressed, and a few minutes after, and at other times in a few hours.

As in this case there could be no shock upon the nervous system, his death, in my opinion, was purely one from the loss of blood. The quantity lost has been variously estimated, but the average would be from eight to ten ounces.

*August 28th, 1848.*





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Author Mott:  
Remarks on the  
importance of  
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